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ABSTRACT

The central question of this study was how gender, ethnicity, and ability influence students' participation in small cooperative groups, especially in relation to leadership. Interaction processes during cooperative group work were recorded in detail on the basis of direct observation and audio-recordings, and transcripts were analyzed by "pattern analysis." The study involved one Dutch school, two teachers, and three classes. All students followed mathematics as well as mother-tongue instruction, as specified in a specially designed curriculum for learning in cooperative groups. In all classes about a third of the students were from non-European backgrounds, mostly North-African (Moroccan). In the analysis eight patterns were distinguished. Some of these were constructive (e.g., the "accepted leadership and delegation" patterns) others were destructive (e.g., "dictatorship" and "sabotage" patterns). When the captain was a girl the boys offered resistance most of the time, while resistance by the girls was the exception. When a boy had the role of captain there was hardly any resistance. Study findings indicated that the gender of the student who takes the role of captain is very important in leadership success, although it is difficult for girls as well as boys to act as captain. The gender factor (sometimes in combination with ethnic background) seems more important than the ability factor in these processes. Although most patterns can be accommodated by the model for interaction in cooperative groups, it is recommended that a third dimension, active versus passive, be included in order to attain a more comprehensive model. (Contains 30 references.) (Author/ND)

Interaction patterns in cooperative groups: the effects of gender, ethnicity and ability.

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Abstract

This paper investigates constructive and destructive patterns related to small group interaction in secondary mathematics and mother-tongue education in heterogeneous classrooms. The central question is how gender, ethnicity and ability influence students' participation in small groups, especially in relation to leadership. In our analysis the focus is on two dimensions as described in Leary's model: (i) cooperation vs. opposition and (ii) dominance vs. submission. Interaction processes during cooperative group work were recorded in detail on the basis of direct observation and audio-recordings. Transcripts were analyzed by 'pattern analysis', a qualitative method of protocol analysis in which recurring episodes in the interaction are investigated. The study involved one Dutch school, two teachers and three classes. All students followed mathematics as well as mother-tongue instruction, as specified in a specially designed curriculum for learning in cooperative groups. In all classes about a third of the students were from non-European backgrounds, mostly North-African (Moroccan). In the analysis eight patterns were distinguished. Some of these were constructive (e.g. the 'accepted leadership and delegation' patterns) others were destructive (e.g. the 'dictatorship' and 'sabotage' patterns). When the captain was a girl the boys offered resistance most of the time, while resistance by the girls was the exception. When a boy had the role of captain there was hardly any resistance. Our general conclusion is, that the gender of the student who takes the role of captain is very important in leadership success, although it is difficult for girls as well as boys to act as captain. The gender factor (sometimes in combination with ethnic background) seems more important than the ability factor in these processes. Although most patterns can be accommodated by our model for interaction in cooperative groups, it is recommended that a third dimension (active vs. passive) be included in order to attain a more comprehensive model.

Objectives and research question

Cooperative groups are expected to improve students' learning processes. However, the facts do not always meet the expectations. Johnson and Johnson (1992), for example, describe various types of ineffective group processes. In the literature some debilitating patterns are described, e.g. those of the 'free rider' and the 'sucker' (Salomon & Globerson, 1989). This paper is about constructive and destructive patterns in small group interaction in mathematics and mother-tongue education in secondary education. The central question is how gender, ethnicity and ability influence students' participation in small groups, especially in the matter of leadership. In our analysis the focus is on two dimensions: (i) cooperation vs. opposition, and (ii) dominance vs. submission.

Theoretical perspectives

According to Webb (1982, 1991), Salomon & Globerson (1989), and Webb & Farivar 1994), not all students benefit from working and learning in small groups. Learning depends in part on the nature of student participation in group work. Students learn more by giving elaborated help to others and less from receiving low-level elaboration by others. Leechor's study (1988) indicates that low-achieving students may not benefit from working in small groups. In addition, other studies found that the higher-aptitude students profit more from group work than students with lower aptitudes (Terwel & Van den Eeden, 1992; Terwel, Herfs, Mertens & Perrenet, 1994; Van den Eeden & Terwel 1994).

An explanation of these findings is given by Cohen & Lotan (1995). From a sociological perspective they argue that status orders emerge within small groups which are based on perceived differences in academic status. High-, and low-achieving students interact differently in cooperative groups. Within small groups high-status students interact more frequently with other students than low-status students. These differences in interaction can lead to differences in learning outcomes (see also: Good, Mulryan & McCaslin, 1992).

However, not only ability or achievement influences interaction. From research on gender we know that gender inequity often occurs in mixed-sex groups participation. Research has consistently shown that male and female students interact differently in mixed-sex classrooms. Male students are more often involved in interactions than female students. Females tend to say nothing and keep silent when teachers pose questions. Male students more often show practices for concealing failures, e.g. by guessing answers, being sensitive to teachers' questions and clues. Male students do not seem as easily disturbed when interrupted. Female students, however, seem more vulnerable to disturbances and counter attacks. In addition, girls participate in such ways that failures come out into the open. (Jungwirth, 1991). How can this difference be explained? The answer must be sought in the 'differential socialization model', and can be stated as follows.

In their development history boys and girls have learned interaction styles that can, respectively, be characterized as 'restrictive' and 'enabling'. To be dominant, competitive, resistant and obstinate is often seen as typical for male students, while the ability to adjust and moderate relates to female stereotypes. Females in their own gender group learn to establish relationships of equality and closeness (Jungwirth, 1991). When these different interaction styles come together in mixed-gender groups, boys will dominate in group interactions. It is during these interactions that images of competence are established. Competence is constructed in the interaction process and status orders emerge. It is not the interaction style as such that causes this effect, but the interaction between interaction style and learning environment (gender-composition of the classroom and/or small group). Within their gender-segregated peer groups, both males and females are often highly interactive. Striving for dominance and leadership is common-place for female students in their own sex-

group. In addition to the strong environmental factor of sex-composition, it appears that the culture of the classroom can strengthen or mitigate the effects of gender-composition of the class (Canada & Pringle, 1995). Teachers can play an important role in giving strong support to female students.

In the present study we view cooperative groups as encompassed by a hierarchical level structure: the classroom, the school and the wider community, subculture or culture (see also Canada & Pringle, 1995). In this view ethnicity may also play a role and may, for example, interact with gender and ability. Within the small group students become interdependent. This interdependence develops over time in more or less fixed patterns. Some students are active, others are passive; some contribute in a constructive way, others are trouble makers or even wreckers. It is often the same students who take the lead, being active and dominant, while others are passive and submissive. These roles are interdependent; as the saying goes, it takes two to tango. But the following also holds: where there is cooperation there is obstruction and conflict. In order to describe and analyze these interaction patterns we adapted Leary's model of interpersonal relationships (Leary, 1957; Créton and Wubbels, 1984). In our model the representation of small group interaction is based on two dimensions: (i) cooperation vs. opposition and (ii) dominance vs. submission. This can be represented in a two-dimensional chart, refined into eight sectors: dominant-opposite (DO), opposite-dominant (OD), opposite-submissive (OS), submissive-opposite (SO), submissive-cooperative (SC), cooperative-submissive (CS), cooperative-dominant (CD) and dominant-cooperative (DC). The graphic representation of this model is depicted in figure 1.

Figure 1: The model for interaction in cooperative groups (Leary, 1957)

Characteristics of the program.

The theoretical context for the program is the Complex Instruction Model, a specific method of working in small groups (Cohen & Lotan, 1995). An instruction unit consists of a series of lessons around the same concepts. Class orientation, group work and class wrap-up are contained in each lesson. Group members take alternating roles including those of captain, facilitator, recorder, provider of resources and reporter (Cohen & Lotan, 1995). Roles make the group members responsible for their work, relieve teachers from management tasks and allow them time for observation and evaluation. Group members may use each other as resources (in terms of backgrounds, experiences and abilities) to complete the tasks (Perrenet and Terwel, 1996).

Methods and research context.

Interaction processes during cooperative group work were recorded in detail on the

basis of direct observation and audio-recording. Transcripts were analyzed by 'pattern analysis, a qualitative method of protocol analysis in which repeating patterns in the interaction are investigated (Van der Kley, 1983). A 'pattern' is a delineated structure of activities of two or more students (and their teacher), based on a common definition of the situation. The study involved one school, two teachers and three classes. All students followed mathematics as well as mother-tongue instruction, as specified in a specially designed curriculum for learning incooperative groups. Three mathematics units and three mother-tongue units were used. All topics were treated on the basis of real-life contexts. The mathematics teacher and the mother-tongue teacher were trained and guided by teacher coaches. In all classes about a third of the students were from non-European backgrounds, mostly North-African (Moroccan).

Data and interaction patterns

Data were gathered in class (20 lessons out of 68). Students' verbal utterances were audiotaped, elaborated in protocols and analyzed. Ethnic background and gender of every student were known. Achievement scores in mathematics and mother tongue were used as ability-indicators. Examples of classroom and small group interactions are given below. We observed a number of patterns concerning the behavior of the group vis-à-vis the behavior of the captain. For every pattern we will provide a name and a description, as well as an illustrative protocol sample and a reflection. In the reflections we relate the observed patterns to the cooperative group model (figure 1). The protocols mostly concern different groups: G1, G2, etc. indicate different girls in a group, B1, B2, etc. different boys in a group.

Results: pattern Analysis

In what follows we shall label and describe every pattern, and give an illustrative sample of the protocol and a reflection. We shall illustrate the first protocol (from a mother- tongue lesson) and the second protocol (from a mathematics lesson) with an example of the curriculum material. Two main categories of patterns are distinguished: (i) opposition against leadership, and (ii) leadership without opposition.

I. Opposition against leadership

Pattern 1: Mental absence
Group members do not pay attention but daydream, whisper about something else or work silently on another subject instead.

Protocol sample:
The group consists of three girls (G1, G2, G3) and two boys (B1, B2). G1 has the role of reporter, G2 that of control, G3 is the captain; B1 is the provider of materials and B2 the provider of information. The subject is mother tongue. The group task is

to describe a route for a school journey (see figure 2); this description will become part of a folder about the school trip. At the end of the lesson the group is to give a presentation about this task. The teacher has also asked the group to explain to theclass the relation of the task with 'reader orientation', which is the theme of the unit.

Figure 2: Sample curriculum material: the case of mother tongue

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G3: I am gonna' read what we have to do. Be quiet!
The two boys are whispering to each other. G2 looks dreamy. G3 reads a few sentences and asks the group about the meaning of 'reader orientation'. No reaction.
G3: Come on boys!
B1: I am listening.
G3: You cannot talk and listen at the same time.

Reflection:
The boys are resisting in a careful way. They are not really disturbing the work of two of the three girls. On the other hand they are not cooperating. They are just letting the time go by. Although the third girl is a little absent minded too, the real problem lies with the boys. The behavior of the boys is *opposite-submissive* in relation to the girl-captain.

Pattern 2: Sabotage
Group members, other than the captain, actively disturb the working process by playing, fighting, making loud noises etc.

Protocol sample:
The group consists of two girls (G1, G2) and two boys (B1, B2). G1 has the role of reporter, G2 is the captain, B1 is the provider of material, B2 is the provider of information and has the role of control. The subject is mathematics. The group task is to calculate how many tiles are necessary to cover the floors of all the rooms of a drawn house. This task is part of the unit about scale. Part of the task is to use the realistic information of a so-called information card (see figure 3).

Figure 3: Sample curriculum material: the case of mathematics

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G2 has read aloud from the information card. The boys criticize her on the quality of her reading.
G1 (to B2): You do the writing, OK?
B1 goes to fetch materials. After his return, he and B2 start wrestling.
G1 and G2 try to do some measurements.
G2 calls for the teacher: Please sir, let them stop. After a while the boys start singing.

Reflection:
Both the girls try to work, but that is hardly possible because of the behavior of the other half of the group, namely the boys. The two girls in this group have a low aptitude in mathematics as well as in mother tongue; this means a low status in terms of Cohen & Lotan (1995). The behavior of the boys is *opposite-dominant* in relation to the girl-captain.

Pattern 3: Take-over
One group member (not the captain) gives orders to the group. The member in question acts as if he or she is the captain; with the result that sometimes even the teacher is fooled.

Protocol sample:
The group consists of two girls (G1, G2) and one boy (B1); a fourth member of the group, a boy, is absent. G1 has the roles of reporter and provider of materials, G2 is the captain; B1 is the provider of information. The subject is mother tongue. The group-task is to continue with planning a route to a certain destination, plus a return route. B1 starts by reading aloud what the group wrote down last time. Initially, neither of the girls is listening.
B1: We are at the Central Station and then we go to the Town Hall ... we take the underground ... Sir...! Could you give us a map of Rotterdam, please?
The teacher (T1) arrives.
T1: You had to plan two routes. The first one to go there, the other one to return.
G2: This is last week's (pointing at a large piece of paper).
T1: What did you do together?
B1: We need another piece of paper!
The teacher goes and fetches a new piece of paper.

Reflection:
One of the rules stipulates that the teacher should communicate with the group captain only. However, in this case there is a great deal of communication with another group member, B1. The boy B1 (Moroccan background) behaves as if he is the captain. The two girls only put up token resistance to this take-over. In our model (Figure 1) the boy's behavior is *dominant-opposite* in relation to the girl-captain. This restrictive behavior is enabled by the girls. This pattern is often seen in mixed-sex groups (Canada & Pringle, 1995).

Pattern 4: Going separate ways
Some group members concentrate on the individual part of the assignment. There is cooperation in subgroups, but not in the group as a whole.

Protocol sample:
The group consists of three girls (G1, G2, G3) and two boys (B1, B2). G1 is the captain, G2 has the role of control, G3 is reporter; B1 is the provider of materials and B2 is the provider of information. The subject is mother tongue. The group task is about types of information in a newspaper.

B1 has been working at his homework for another subject. Both boys now take their individual tasks and start working together. G2 and G3 are watching G1, who is making a poster.
B1: What would you put in a newspaper if you where the boss?
B2: News about foreign countries.
B1 and B2 continue together. G2 and G3 are ready to assist the captain G1.

Reflection:
Most group members are working, but there are two subgroups: the boys and the girls. There is not much cooperation between the two subgroups. In this case a girl is the captain and the other girls follow her. The behavior of the boys is *opposite* in relation to the girl-captain.

We now turn to an overview of the frequencies of the patterns described. The number of lessons observed was 18. Three lessons consisted mainly of class-discussion; 15 lessons contained a large measure of group work. Often several patterns occurred in a group within the same session and sometimes patterns did not stand out clearly. However, the following trends emerged from the 15 lessons with group work.
The captain was a girl in 11 cases and a boy in 4 cases. With girls as captains the boys offered resistance most times (7 times out of 11), while resistance by the girls was the exception (1 out of 11 times).

All four patterns occurred in the boys' opposition behavior vis-à-vis female captains: 'mental absence', 'sabotage', 'take-over' and 'going separate ways'. These patterns show a variety of *opposite* behavior in relation to the female captain. When the captain was not only a girl, but also had low status, the opposition was strongest and most of the times took the form of 'take-over' (dominant-opposite) or 'sabotage' (opposite-dominant).

Sometimes the teacher intervened, but could not stop the opposition. In such cases one pattern of opposition changed into another (for example 'sabotage' into 'going separate ways'). Opposition by girls to a female captain took place only once, and this in a special context, since the captain was a new member in the group; she had been transferred from another group. With a boy as captain there was hardly any opposition. Opposition to leadership mostly occurred in lessons during the beginning and the middle of the complex instruction period. Some acceptance of leadership took place during lessons at the end of the period. A final remark concerns the situation of two low-status students in the same group. In such cases Roedel & Nelson (1996) would predict a struggle between the two low-status group members. Low-status students in the same group should try to show their position as being relatively higher. We observed a group with two low-status members, both being girls (see the protocol under pattern 2). However their behavior was not competitive towards each other, but supportive. Next, we turn to those patterns that describe the forms of observed behavior of leaders without opposition. We shall use our model to characterize the behavior of the appointed leader in relation to the group. Again we distinguish four patterns (patterns 5 to 8).

II. Leadership without opposition

Pattern 5: No leadership
The captain does not act in accordance with the role; the working process is without structure. Sometimes another group member tries to organize the group work, but without the intention to assume the role of captain.

Protocol sample:
The group consists of three girls (G1, G2, G3) and two boys (B1, B2). G1 is facilitator, G2 is the reporter, G3 is the provider of information; B1 has the role of provider of materials and B2 is the captain. The subject is mathematics. The group task is to construct a register of street names for a given city map.
B1 and B2 are chatting together. G1 is looking around. G2 takes the card with the assignment on it and starts to read. G3 is looking at what G2 is doing.
G2: I know ... you have to draw something on the blackboard.
B1 and B2 take their cards with individual assignments.
G2: Who is the captain?
B2: Me.
G2: We have to draw something on the blackboard.
G2 reads the group task aloud.
B2: We have to do our individual tasks.
G2: No, we are not finished yet. We have use the blackboard.
G2 looks around uncertainly.
G2: We have to ask... Who has to ask?
B2: The captain.
G2: So, ask.
B2 gets up and goes to the teacher.

Reflection:
Where the captain takes no real initiative to organize the group work, another group member tries to do it. In such cases, the behavior is not opposition to the leadership but filling a gap. There is no competition about the role. The behavior of the captain is *passive and more or less neutral* in relation to the behavior of the group. This pattern does not fit in very well with the model.

Pattern 6: No delegation
The captain does all the work. Most of the time the other group members are passively waiting to be given something to do.

Protocol sample:
The group consists of three girls (G1 G2, G3) and one boy (B1); the fifth group member, another boy, is absent. G1 has the role of control, G2 is the captain, G3 is reporter; B1 is the provider of materials. The subject is mathematics. The group task is to construct a register of street names at a given city map.
G2 and G3 have quarreled about who might take the vacant role of provider of information, which, in the end, nobody takes up.

G2, the captain, takes the ruler and draws vertical lines for a coordinate system. She is the only one doing something; the others are waiting. B1 and G3 talk about the other boy, who is ill. They recite the names of all the other students that are missing.
G1 (to G2): What time is it?
G2: Only five minutes left!
She contains; the others are waiting.

Reflection:
The captain feels responsible for the work, but does not try to share the tasks with the other members of the group. The behavior of the captain is *active and more or less neutral* in relation to the group. Just like pattern 5, this pattern does not really fit in with the model.

Pattern 7: Dictatorship
The captain is shouting his instructions and threatens punishments if he is not obeyed. Little work gets done.

Protocol sample:
The group consists of one girl (G1) and two boys (B1, B2). G1 has the role of reporter, B1 has the role of control and is the provider of information at the same time, B2 is the captain and is the provider of materials. The subject is mathematics. The group task is to build a scale model of a house.
G1: I'll read.
She starts reading. B1 and B2 are fighting; B2 threatens B1 with expulsion from the classroom. G1 is struggling with the text. After some difficulties G1 has finished her reading.
B2 (shouting): Read the first question!
G1: But, I just did.

Reflection:
The captain spends most of his energy trying to discipline his group members and pays little attention to the working process. The behavior of the captain is *dominant-opposite* in relation to the behavior of the group.

Pattern 8: Accepted delegation
Group members follow the instructions of the captain. The working process has structure. The group functions more or less smoothly.

Protocol sample:
The group consists of three girls (G1, G2, G3) and two boys (B1, B2). G1 is the captain, G2 is the provider of information, G3 has the role of control; B1 has the role of provider of materials and B2 is the reporter. The subject is mathematics. The group task is to calculate how much material is needed for the ground floors of a house and how much it will cost. The group has to prepare a presentation.
G1 reads the instructions for the presentation aloud. There is a lot of noise in the class room and it is hard to make out what she is saying. Consequently, when she is

finished, the two boys ask for the written instructions, to read these for themselves.
G1: First, we have to add everything up. Come on. You (to B1) have to calculate how long this is and you (to G3) how long that is. She points to different places in the drawing. B1 takes his ruler and starts measuring. B2 and G2 are working together on another part.
G3: I don't understand.
G1: I not going to repeat it; I just explained it to you.
G3: But that does not mean that I understood it.
G1 gives a more extensive explanation and G3 starts working too.

Reflection:
The captain has a grasp of what has to be done and tells the others what to do. The others accept the captain's leadership. The work gets done. The behavior of the captain is *dominant-cooperative* in relation to the group.

Again we shall give an overview of the frequencies of the described patterns in the 15 lessons with group work. We distinguished four patterns (patterns 5 to 8) in the category *'Leadership without opposition'.*

The pattern of 'no-leadership' was observed in 10 lessons. Five times there was no-leadership behavior from the start of the lessons (captains were boys as well as girls). In the other five cases the 'no-leadership' pattern followed a pattern of strong opposition behavior of boys vis-à-vis a girl captain (patterns 1 and 2). 'Dictatorship behavior' by a boy (dominant-opposite) occurred once. There were two occurrences of 'no-delegation' behavior (by a boy-captain as well as by a girl-captain). 'Accepted leadership' occurred only once; the captain was a girl and her behavior was dominant-cooperative. The 'no-leadership' and 'no-delegation' patterns do not fit in very well with our cooperative group model. The patterns are characterized by individualistic behavior of the captain in relation to the group.

Results and Conclusion

Eight patterns were distinguished concerning the group's behavior in relation to the captain. Some of these were constructive, e.g. the 'accepted leadership' and 'delegation' patterns, others were destructive (e.g. the 'sabotage' pattern). Most patterns can be accommodated by our model for interaction in cooperative groups (figure 1). When the captain was a girl the boys offered resistance most of the time, while resistance by the girls was the exception. Sometimes the teacher intervened to stop the resistance, without success. Resistance by girls against a female captain only occurred once. However, this was a special case, in that the captain, having been transferred from another group, was perceived as a new member of that particular group. Acceptance of leadership took place during lessons at the end of the program. With a boy as captain there was hardly any resistance. Our general conclusion is that the importance of gender for the captain's role is paramount in leadership success. But this role is difficult for girls as well as for boys. The ideal form of leadership is

cooperative-dominant. It looks as if girls try harder, but face more resistance, given that boys find it difficult to accept female leadership. Most of the time girls take the side of the girls and boys take the side of the boys. In these processes, then, the gender factor (sometimes in combination with ethnic background) seems more important than the ability factor.

During the series of lessons there was only a small shift from opposition to leadership in the direction of acceptance of leadership. Even without opposition the role of captain often was not acted out. Most of the patterns fitted in well with the 'opposition-cooperation' and 'dominance-submission' two-dimensional cooperative group model . Patterns of individualistic captain behavior are the exception.

Educational and theoretical significance

Canada & Pringle, (1995) found that the gender composition of the classroom and/or small group is an important factor. From our study it appears that the classroom culture (for example, in the matter of masculine or feminine orientation) can strengthen or mitigate the effects of gender-composition of the class and the small group. The implementation of 'cooperative models', 'structures', 'treatments' or 'scripts' to regulate interaction processes is a relevant, but not a sufficient factor. In addition we found the gender factor to be more significant than the status factor (as indicated by ability) in explaining constructive and destructive patterns of group interaction. In order to effect equal access to resources and equity in interaction processes, it is important for teachers to be aware not only of these factors, but also of the dynamics involved.

Our model of interaction in cooperative groups (figure 1) and the theory of interpersonal relationships proved useful in the analysis of small group interaction processes and, in our view, could be used in teacher education and in-service training. However some limitations of Leary's two-dimension model were detected. Not all patterns could be accommodated by the model. It would seem , as a result of our observations with regard to patterns 5 ('no leadership') and 6 ('no delegation'), that at least one more dimension would have to be postulated, namely an active vs. passive dimension. We should note here that the Adaptation model of Farrell (1993), as described by Van Yperen (1995), is based on two dimensions Active vs. Passive and Constructive vs. Destructive. These two dimensions might be more suited to inclusion patterns 5 and 6 in the model. In addition, the two dimensions postulated by Farrell, which are used as 'lenses' in pattern analysis, might reveal new and interesting patterns in small group learning.

Both Leary's model (figure 1) and Farrell's model (figure 4) are useful for teacher education and teacher guidance. Together these models offer four dimensions for the analysis of interaction processes, which can can be summarized as follows:

dominance versus submission
opposition versus cooperation

active versus passive
destructive versus constructive

These dimensions might be used as a kind of vocabulary for communicating with teachers and students, in order to increase awareness of patterns involving fostering or abandonment. The availability of labels for the description of interaction patterns might provide teachers and students with greater insight into the ways they interact, and, ultimately, greater control over their own situations and more alternatives.

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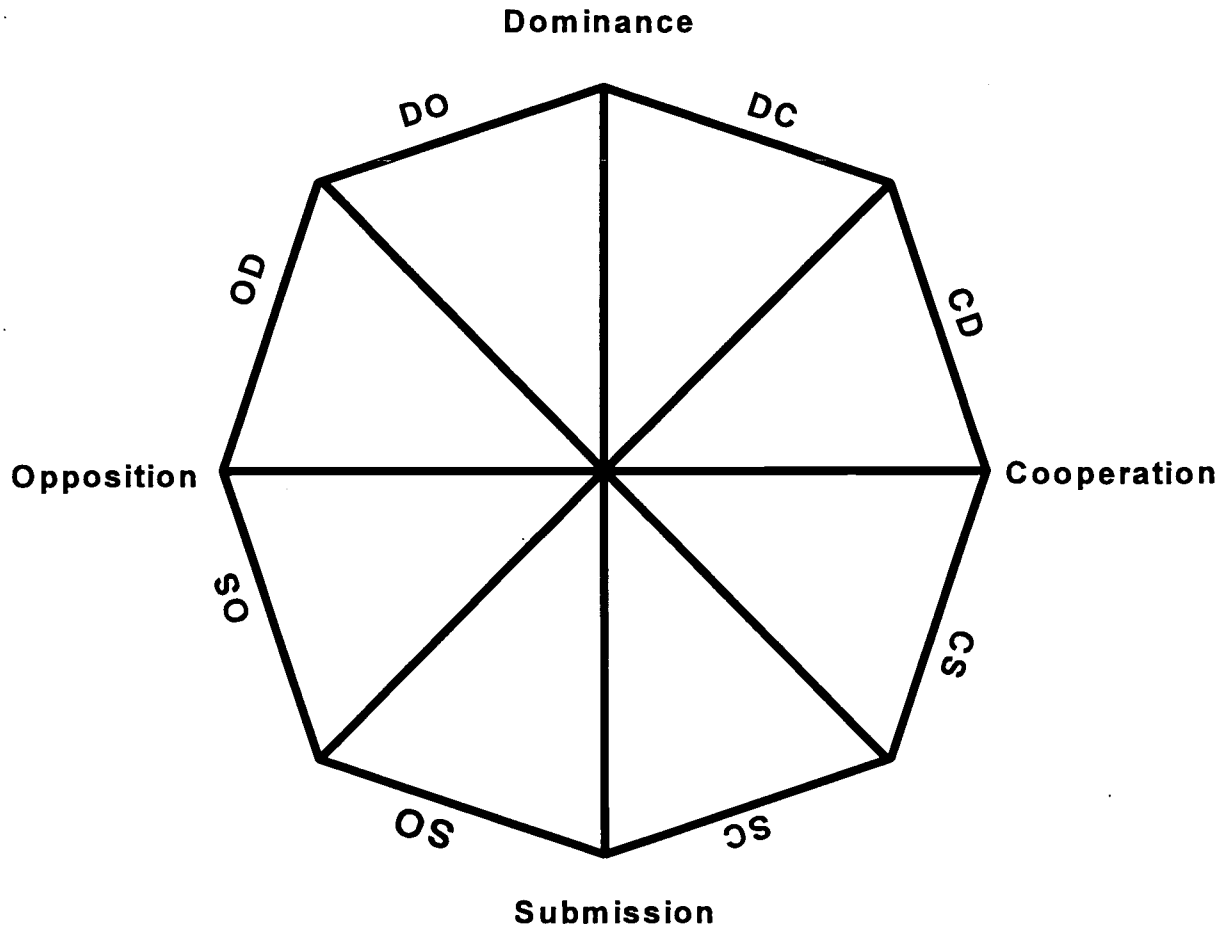

Figuur 1 Model for interaction in cooperative groups (Leary, 1957)

FOLDER FOR A DAY TRIP **TRANSPORT**

Group task

The class will travel with public transport from Utrecht to the city chosen as destination. They did not want to hire a bus. For this group task you could use the computer with the travel-plan program, the railway guide and the bus guides.

1. Find out how to go by train and by bus from Utrecht Central Station to the central station of the chosen destination. Look at the planning for the day and keep the following in mind: At what time should the class be at the destination? At what time should the trip back start? At what time should the class be home again at the latest?

Note: If you already completed the group task ROUTE, then you have to take in account the time schedule.

If everybody is finished (who will check that?), you can take assignment 2 out of the envelope (who will do that?).

Figure 2: Sample curriculum material: the case of mother tongue

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THE HOUSE **FLOOR-COVERING**

Information card 1

When you have to buy floor-covering for a room you have to decide in advance what kind of floor-covering you want. You might want a carpet, or cork, lino, or wood, etc. Your choice of material or color are important, but it is not the only thing. Because there can be big differences in price. The best way is first to have a good look round about what is for sale and to find out what the costs will be.

The following data are from a folder.

Carpet

Deep-pile woolen carpet, very good for both nurseries and living rooms.

Available colors: gray, green-of-grass, blue and beige.

Width 2 meters. Price: 69 guilders per running meter.

NOW at the ridiculously LOW price of 40 guilders! (laying included)

Floor-cloth tiles

It is very easy to clean floor-cloth tiles.

Available in various colors: red, green, blue and yellow.

Tile dimensions: 50 by 50 centimeters.

Normally a tile costs 7 guilders, NOW for the extremely LOW price of 5 guilders per tile! (glue and laying included)

Figure 3: sample curriculum material: the case of mathematics

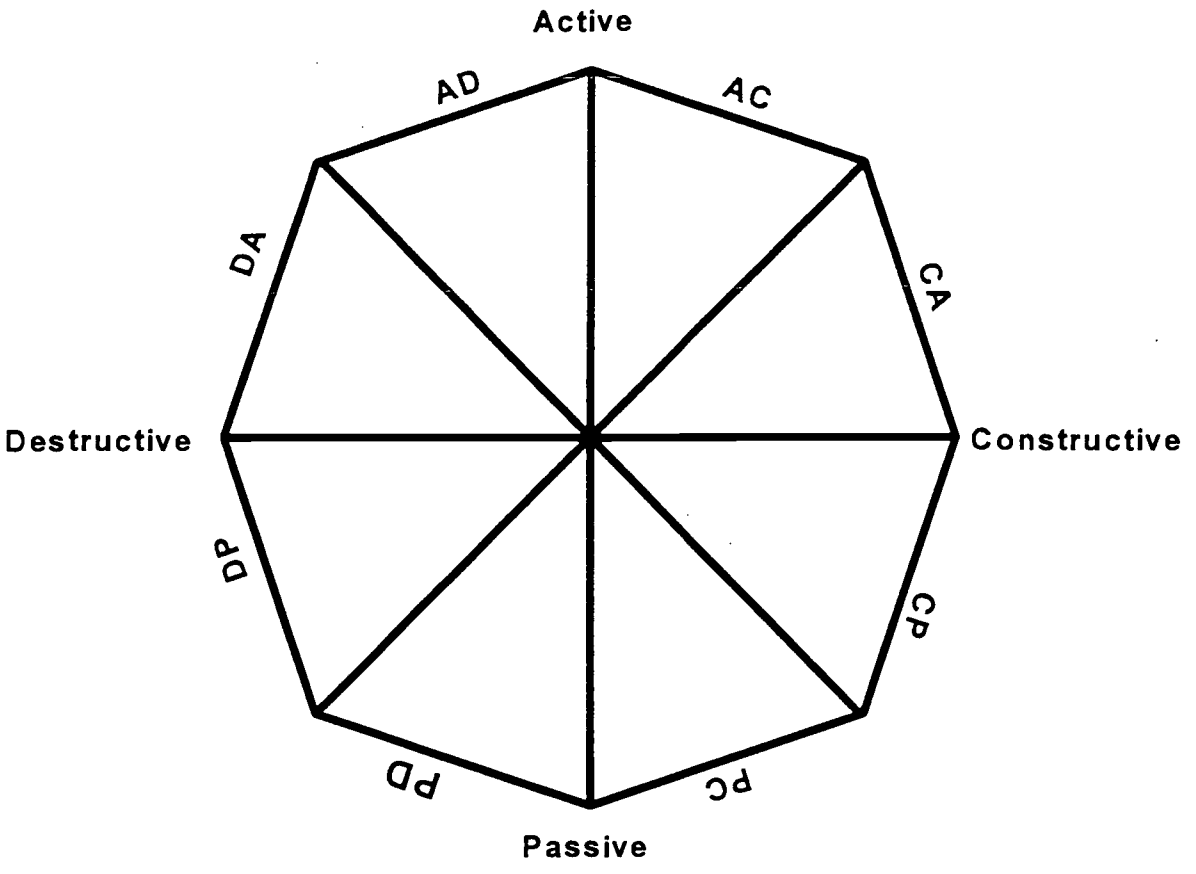

Figure 4 Model for interaction in cooperative groups (Farrell, 1993)

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